

UTAH INDIANS

High broken	Table - Lands
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
20	20
21	21
22	22
23	23
24	24
25	25
26	26
27	27
28	28
29	29
30	30
31	31
32	32
33	33
34	34
35	35
36	36
37	37
38	38
39	39
40	40
41	41
42	42
43	43
44	44
45	45
46	46
47	47
48	48
49	49
50	50
51	51
52	52
53	53
54	54
55	55
56	56
57	57
58	58
59	59
60	60
61	61
62	62
63	63
64	64
65	65
66	66
67	67
68	68
69	69
70	70
71	71
72	72
73	73
74	74
75	75
76	76
77	77
78	78
79	79
80	80
81	81
82	82
83	83
84	84
85	85
86	86
87	87
88	88
89	89
90	90
91	91
92	92
93	93
94	94
95	95
96	96
97	97
98	98
99	99
100	100

Data

The road from the direction of Bents Fort to Santa Fe and from Santa Fe to Taos and the astronomical positions given in the map are from the unpublished map of Lieut Emory, except the latitude of Taos by Lieut Warner, U.S.A. Topographical sketches by Lieut W.G. Peck, I.E.

This map is connected with the map of Senate Document N° 418: 1st Session, 29th Congress.

Published by order of the War Department

NAJO INDIANS

High Table Lands... no running water

Tide lands, with frame grass, but no standing water.

MAP

of the

TERRITORY OF NEW MEXICO.

made by order of

BRIG. GEN. S.W. KEARNY.

under instructions from

LIEUT. W. H. EMORY, U. S. T. E.

by

LIEUT'S. J. W. ABERT and W. G. PECK, U. S. T. E.

1846-7.

J. E. Collins and J. R. Brown

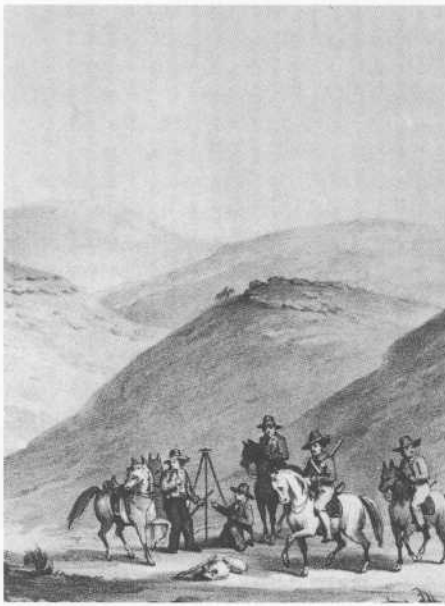
Scale of Miles

Explorations and Surveys

View of the insulated table lands at the foot of the Rocky Mountains.



Library of Congress



Office of History, Corps of Engineers

Survey party at work.

Although the reconnaissance of the trans-Mississippi West began with the epic journey of Lewis and Clark in 1804-1806, another 10 years passed before the government began to establish the basis for the professionalization of official exploration. In 1816 topographical officers, known as geographers during the Revolution and as topographical engineers during the War of 1812 and thereafter, were added to the peacetime Army. Unlike the other officers of the Corps of Engineers, whose primarily military duties centered on the construction and maintenance of fortifications, "topogs" performed essentially civil tasks as surveyors, explorers and cartographers. Two years later the War Department established the Topographical Bureau under Major Isaac Roberdeau to collect and store the maps and reports of topographical operations. Like the topogs, who numbered only six at this early date, the bureau was placed under the Engineer Department.

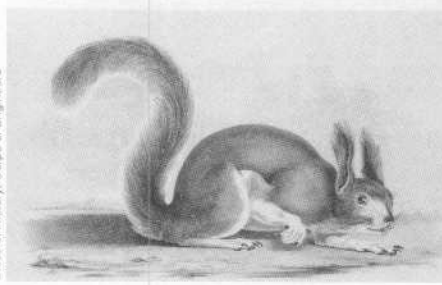
Almost from the outset there was a great demand for the skills of the topographical engineers. The accelerated movement of Americans into the interior of the continent served to emphasize the nation's need for networks of transportation and communication. Congress

recognized the compelling nature of the requirement in 1824 by passage of the General Survey Act. This law, which authorized surveys for a national network of internal improvements, became the basis for topog involvement in the development of canals, roads and later, railroads.

Along with the growing importance of the topogs came increases in their numbers and improvements in the organizational structure. Most of the changes came during the first decade of Colonel John J. Abert's tenure as Chief of the Topographical Bureau. A strong-willed and ambitious West Pointer who received the appointment after Roberdeau died in 1829, Abert sought independence for both the bureau and the topogs. He realized the first goal in 1831, when Congress removed the bureau from the Engineer Department and gave it departmental status under the secretary of war. Seven years later he attained the second objective and became Chief of an independent Corps of Topographical Engineers, a position he held for 23 years.

Colonel Abert sought a great deal more for the topogs than prominence within the bureaucracy. While Roberdeau had been content to manage the office as a depot for maps and instruments and as a

Map of the Rio Grande Valley, drawn in 1846-47 for Mexican War reconnaissance.



Sciurus Aberti, squirrel named for John J. Abert, drawn by Richard H. Kern.

clearinghouse for correspondence, Abert saw his role as a planner and administrator for national policy regarding internal improvements and western exploration. As a member of the Board of Engineers for Internal Improvements, established to evaluate projects considered under the General Survey Act, Abert had a part in the selection of tasks and their execution. In western exploration, which for many years took a back seat to internal improvements, Abert's role remained minor. His bureau distributed instruments, collected maps and forwarded correspondence.

Individual members of the Corps of Topographical Engineers, however, achieved great importance in western exploration and surveys. During the expansionist era of the 1840s, from the first stirrings of Oregon fever in the early years of the decade to the acquisition of the huge southwestern domain after the Mexican War, topogs examined the

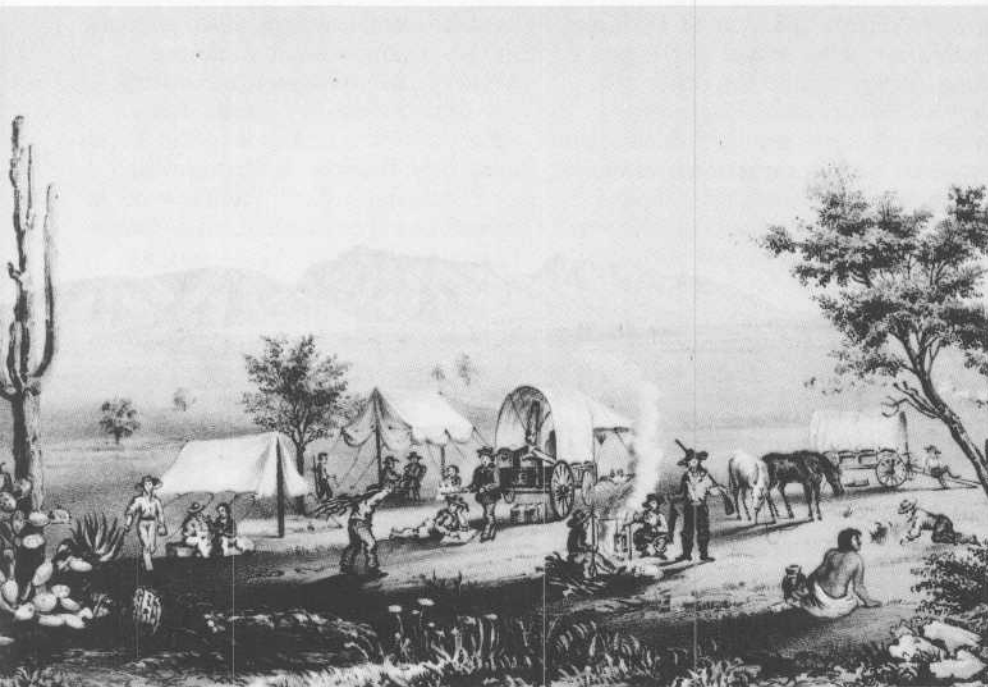
new country and reported their findings to a populace eager for information about the lands, native peoples and resources of the West. Best known of all was John C. Frémont, the dark-eyed and flamboyant Pathfinder who led three parties to the Rockies and beyond during this age of expansion. The ranks also included William H. Emory, author of a perceptive assessment of the Southwest, and James H. Simpson, discoverer of the ruins of the ancient Pueblo civilization of New Mexico. Howard Stansbury, whose report of an exploration of the Great Salt Lake is still considered a frontier classic, also wore the gold braid of the Corps of Topographical Engineers. In the 1850s, when the emphasis shifted from reconnaissance to more detailed exploration and roadbuilding, topogs continued to make their marks. John N. Macomb laid out the basic road network of New Mexico and George H. Derby initiated harbor improve-

ments in California, while Joseph C. Ives became the first Anglo-American to descend the Grand Canyon.

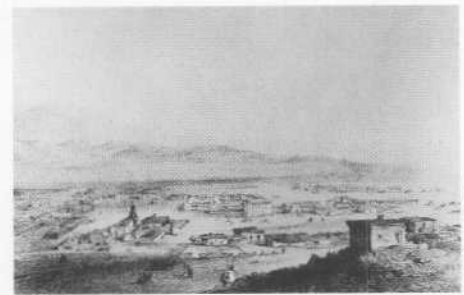
The disparity between the renown of members of Abert's Corps and the obscurity of his bureau was due to the absence of a government policy regarding exploration. Topographical engineers frequently went into the new country on an *ad hoc* basis, at the behest of a politically powerful figure like Missouri Senator Thomas Hart Benton, or to accompany a military expedition. From Major Stephen H. Long's 1819 journey up the Missouri River as a minor adjunct of Colonel Henry Atkinson's Yellowstone Expedition to Emory's Southwestern Exploration with the Army of the West during the Mexican War, topog exploration often took a secondary position to other purposes.

When exploration and surveys in the trans-Mississippi West were finally organized and coordinated in the 1850s, Abert no longer wielded the political influence that had brought his ambitions so near fruition in the 1830s. Duties he hoped would devolve on the Topographical Bureau went instead to the Office of Pacific Railroad Explorations and Surveys. This small organization, created by Abert's political foe, Secretary of War Jefferson Davis, managed the surveys for railroad routes to the Pacific Ocean. Of the leaders of the survey parties, only former engineer Isaac I. Stevens was not a topog. The railroad surveys produced a multi-volume report that was a veritable encyclopedia of trans-Mississippi natural history as well as reconnaissances of future railroad routes to the Pacific.

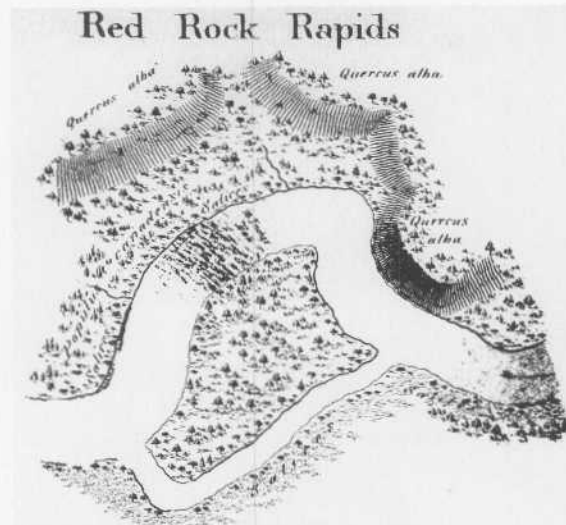
Despite the lack of a unified policy and central direction, the history of topog expeditions forms a coherent entity. Topographical officers provided the necessary link between the first explorations of the mountainmen—those rude, brawling



Pacific railroad survey party camped in the Mohave Valley.



Library of Congress



A portion of John C. Fremont's 1841 map of the Des Moines River.

National Archives

Engineer Observations of the *Aurora Borealis*

While exploring and surveying the American West in the 19th century, Army engineers and topographers amassed a wealth of scientific information. Their concerns included archeology, astronomy, botany, biology and meteorology. Little known are a series of astronomical observations made by engineer officers undergoing training at the Engineer School of Application at Willets Point, New York, in the 1870s and 1880s.

The engineers made the bulk of their studies from an observatory constructed on the post in 1868. A new observatory boasting telescopes, transits, chronometers and chronographs opened in September 1879. The officers calculated longitude and latitude utilizing the sun, moon, stars and planets. In the course of their training exercises, which supplemented classroom work, the students had the opportunity to observe and record unusual phenomena. Such was the case in a series of systematic field observations of the *aurora borealis* begun in February 1870 and continued through 1884.

The engineers made the auroral observations purposely in an effort to determine the relation-

ship between auroral displays and the frequency of sunspots and magnetic disturbances. Sentinels from the engineer battalion on duty from sunset to sunrise at three guard posts recorded all visual sightings, noting whether skies were clear or cloudy. To account for human error, especially for the difficulty of identifying fainter displays, the battalion compiled tables noting the three independent observations, calculating a mean average and estimating the number of displays that might have occurred on cloudy nights. Officers stationed at the engineer supply depots at Washington Barracks, Missouri, and at Yerba Buena Island in San Francisco Bay also made their own less detailed observations, which in turn were compared with those at Willets Point.

While records of sunspot activity were not kept systematically, the battalion commander concluded from data available that the years of maximum and minimum sunspot activity corresponded with maximum and minimum auroral displays. The auroral statistics gathered at Willets Point are the earliest available and today continue to be useful to scientists studying the recurrence of the *aurora* and its relationship to sunspot activity.

beaver trappers who first probed far beyond the frontier and were no less than walking storehouses of geographical knowledge—and the civilian scientific specialists who undertook a rigorous study of western natural history and resources after the Civil War. Between the trappers and the specialists of the United States Geological Service, topogs provided the nation with an overall picture of the trans-Mississippi region. They explored bits and pieces as opportunity allowed until a coherent general understanding of western topography emerged in the form of Lieutenant Gouverneur K. Warren's map of 1858. His achievement, the first accurate overall depiction of the trans-Mississippi West, was a milestone in American cartography. Thereafter, topog activity centered on filling in the few blank spaces in Warren's map. During the Civil War, the Corps of Topographical Engineers was merged into the Corps of Engineers, whose officers renewed the topogs' efforts after Appomattox. Within a few years, however, civilian scientists took over the work and carried it forward. By then the officer-explorers had done their major task. They had extended and codified the knowledge of the mountaineers and in turn laid the groundwork for scholarly analysis. The topographical engineers had performed an essential service to a nation growing in size and in self-understanding.